

2006/8/30

## CURRICULUM VITAE

**NAME:** Nancy Chyan Huei Lo  
Tel: (858) 546-7123  
Fax: (858) 546-5656  
E-mail: Nancy.Lo@noaa.gov

**ORGANIZATION:** National Oceanic & Atmospheric Administration  
National Marine Fisheries Service  
Southwest Fisheries Science Center  
8604 La Jolla Shores Dr.  
La Jolla, California 92037

**PRESENT POSITION:** Mathematical statistician

**DISCIPLINE:** Statistics and Mathematics

**EDUCATION:**

B.S. Business Administration, National Taiwan University, 1964

M.S., Statistics, Oregon State University, 1968

Ph.D., Statistics, Oregon State University, 1972

**TITLE OF DISSERTATION:**

Performance of some tests for bivariate independence, interchangeability and equality of distributions of ratios. (Ph.D. dissertation, Oregon State University, 1972)

A generalization of a scheduling algorithm (Master's report, Oregon State University, 1968)

**EXPERIENCE:**

1980 - present	Mathematical Statistician Fishery Resource Division Southwest Fisheries Science Center National Marine Fisheries Service La Jolla, California
1998 - 2002	Adjunct Professor Department of Mathematical Science

1990 - present	San Diego State University Visiting Professorship Centro Interdisciplinario de Ciencias Marinas La Paz BCS, Mexico
Feb - May 1986	Visiting Professorship National Taiwan College of Marine Science & Tech. Taiwan, ROC.
1976 - 1980	Mathematical Statistician Porpoise and Tuna Interaction Program Southwest Fisheries Center National Marine Fisheries Service La Jolla, California
1972 - 1976	Statistical Method Analyst California Dept. of Fish and Game Menlo Park, California
1973 - 1974	Part-time Lecturer Foothill College Los Altos, California

#### **RESEARCH INTERESTS:**

Application of statistical techniques to fishery and marine mammal biology: sampling scheme, estimation, prediction, and modeling, in particular related to fishery-independent sea surveys.

#### **HONORS AND AWARDS:**

Distinguished Service Award, The San Diego Chapter of the American Statistical Association: 2002, 2005  
 Special Act Award: 2000  
 Special service award: 1998, 2003  
 U.S. Department of Commerce Bronze Medal for Superior Federal Service, 1996  
 Best Publication awards: Best Publication for the Fishery Bulletin 1994, 2002  
 Promotion 1995  
 Quality Step Increase, 1990, 1996, 1999  
 Outstanding Performance Awards: 1981, 1984, 1986, 1989, 1994, 1999  
 Superior Performance Awards: 1979, 1982, 1993

## **PROFESSIONAL AFFILIATIONS:**

American Statistical Association (ASA)  
(ASA San Diego Chapter, Vice-Chair, 1986-91  
Nominations and Elections Committee Chair 1999- 2001  
President, 2003-2005; past-president, 2005-2007)

International Chinese Statistical Association (ICSA)  
(the Executive Director of ICSA, 1995-1997, Board of Directors, 1998-2000)

American Fisheries Society (1998 - 1999)

## **SELECTED SERVICE ON SCIENTIFIC COMMITTEES:**

Doctoral committee for Yanira A. Green Ruiz and Eva Cotero, CICESE, Ensenada, Mexico (1993 - 2000)

Exterior examiner for the Doctoral candidate, Smt. Vijayamna T.N., School of Marine Sciences, Cochin University of Science and Technology, Kochi, India (1997 -2000). Her thesis is entitled ‘Studies on Marine Ornamental Fishes of Lakshadweep’.

## **PUBLICATIONS:**

Nancy C.H. Lo, Anne C Allen, Sharon Herzka. 2006. Minutes of the 2005 Trinational sardine forum. Ensenada, Baja California, Mexico, November 14-15, 2005. SWFSC Admin. Rep LJ-05-06.

Lo, N.C.H. and B. Macewicz. 2005. Spawning biomass of Pacific sardine (*Sardinops sagax*) off California in 2005. NOAA Technical Memorandum NMFS-SWFSC-387.

Hill, K.T., N.C.H. Lo, B. J. Macewicz and R. Felix-Uraga. 2005. Assessment of the Pacific sardine (*Sardinops sagax caerulea*) population for U.S. management in 2006. NOAA Technical Memorandum NMFS-SWFSC-386.

Lo, Nancy C. H., Beverly J. Macewicz and David A. Griffith. 2005. Spawning biomass of Pacific sardine (*Sardinops sagax*), from 1994-2004 off California. CalCOFI Rep., vol. 46, p 93-112.

Goericke, R., E. Venrick, A. Mantyla , J. Bograd ,F.B. Schwing, A. Huyer, R.L. Smith , P.A. Sheller, R. Hooff , W.T. Peterson, F. Chavez , C. Collins , B. Marinovic, N. Lo, G. Gaxiola\_Castro, R. Durazo ,K.D. Hyrenbach, and W.J. Sydeman. 2005, The state of the California Current, 2004-05: Still Cool?. CalCOFI Rep., vol. 46, p 32-71.

Nancy C.H. Lo, Sandy McFarlane, Jake Schweigert, Robert Emmett, Timothy Baumgartner, Ray

Conser, Yanira Green-Ruiz, Darrell Kapp, Richard Charter, Beverly Macewicz, Martin E. Hernandez-Rivas, Sarita De La Campa, and Rick Brodeur. 2005. Meeting reports of Working Group 2, Trinational Sardine Forum: Regional biomass of Pacific Sardine (*Sardinops sagax*) off west coast of northern American continent, in 2003 and **2004**. SWFSC Admin. Rep. LJ-05-09, 43 pp.

Kim, J. Y., N. C. H. Lo and J. I. Kim. 2005. Correction factors for quantitative analysis of anchovy eggs and larval stages from the South waters of Korea. Ocean Science Journal, 40 (1):11-16.

Lo, N. C. H. and B. Macewicz. 2004. Spawning biomass of Pacific sardine (*Sardinops sagax*) off California in 2004 and 1995. SWFSC Admin. Rep. LJ-04-08, 30 pp.

Smith, D. R., J. Brown, and N. Lo. 2004. Application of adaptive sampling to biological population. In Sampling rare or elusive species (ed by Bill Thompson). Island Press.

Macewicz, B. J. J. R. Hunter and N. C. H. Lo. 2004. Fecundity, egg deposition, and mortality of market squid, *Loligo opalescens*. U.S. Fish. Bull. 102:306-327

Chen, Hailiang, N. Lo, and B. Macewicz. 2003. MS ACCESS programs for processing data from adult samples, estimating adults parameters and spawning biomass using daily egg production method (DEPM). SWFSC Admin. Rep. LJ-03-14.

Macewicz, B. J. J. R. Hunter and N. C.H. Lo. 2003. Lifetime fecundity of the market squid, *Loligo opalescens*, with application to monitoring escapement. Report of the working group on modern approaches to assess maturity and fecundity of warm-and cold-water fish and squids (ed by Kjesbu, Hunter and Witthames). Fisk og havet, no 12 -2003. Havforsknings Instituttet, Institute of Marine Research. Bergen, Norway: p.79-88.

Nancy C.H. Lo, 2003. Daily egg production and spawning biomass of Pacific sardine (*Sardinops sagax*) of California in 2003. SWFSC Admin. Rep. LJ-03-11, 19 pp.

Nancy C.H. Lo and B. Macewicz, 2002. Daily egg production and spawning biomass of Pacific sardine (*Sardinops sagax*) of California in 2002. SWFSC Admin. Rep. LJ-02-40, 22 pp.

Lo, N. C. H., J. R. Hunter and R. Charter. 2001. Using a continuous egg sampler for ichthyoplankton surveys: application to the daily egg production of pacific sardine off California. Fish. Bull 99: 554-571.

Jing-Yong Kim and Nancy C. H. Lo. 2001. The effect of regime change on seasonality of egg production and spawning biomass of Pacific anchovy in the southern waters of Korea in 1983 - 1994. Fisheries Oceanography 10(3):297-310.

Nancy C. H. Lo, 2001. Daily egg production and spawning biomass of Pacific sardine (*Sardinops sagax*) of California in 2001. SWFSC Admin. Rep. LJ-01-08, 31 pp.

- Lo, N. C. H., J. R. Hunter, and J. H. Churnside. 2000. Modeling statistical performance of an airborne lidar survey system for anchovy. Fish. Bull. 98:264-282.
- Lo, N. C. H., J. R. Hunter, and J. H. Churnside. 1999. Modeling properties of airborne lidar surveys for epipelagic fish. SWFSC Admin. Rep., La Jolla, LJ-99-01, 48 p.
- Hill, K. T., M. Yaremko, L. D. Jacobson, N. C. H. Lo, and D. A. Hanan. 1998. Stock assessment and management recommendations for Pacific sardine (*Sardinops sagax*) in 1997. Calif. Dep. Fish Game, Marine Region Admin. Rep. 98-5, 53p.
- Nancy Lo, "The past, the present and the future of International Chinese Statistical Association", Encyclopedia of Statistical Science, Vol 3, John Wiley & Sons, 1997.
- Lo, N. C. H. 1997. Empirical analyses of the precision of regression estimates of daily egg production and egg mortality of pelagic fish for daily egg production method. Ozeanografika 2:71-89.
- Hunter, J. R. and N. C. H. Lo. 1997. The daily egg production method of biomass estimation: some problems and potential improvements. Ozeanografika 2:41-69.
- Polacheck, T., E. Pikitch, and N. Lo. 1997. Evaluation and recommendations for the use of aerial surveys in the assessment of Atlantic bluefin tuna. SCRS/97/73. The International Commission for the Conservation of Atlantic Tuna (ICCAT), Standing Committee on Research and Statistics.
- Pertierra, J. P., J. Leonart and N. C. H. Lo. 1997. Application of a stage-specific matrix model and length-cohort based analysis to assess the anchovy fishery in Catalan coastal waters (NW Mediterranean Sea). Fish. Res. 30(1997):127-137.
- Moser, H. G., N. C. H. Lo, and P. E. Smith. 1997. Vertical distribution of Pacific hake eggs in relation to stage of development and temperature. Calif. Coop. Oceanic Fish. Invest. Rep. 38:120-126.
- Lo, N. C. H., D. Griffith, and J. R. Hunter. 1997. Using a restricted adaptive cluster sampling to estimate Pacific hake larval abundance. Calif. Coop. Oceanic Fish. Invest. Rep. 38:103-113.
- Barnes, J. T., M. Yaremko, L. Jacobson, N. C. H. Lo and J. Stehly. 1997. Status of the Pacific sardine (*Sardinops sagax*) resource in 1996. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-SWFSC-237, 52 pp.
- Fletcher, W. J., N. C. H. Lo, E. A. Hayes, R. J. Tregonning and S. J. Blight. 1996. Use of the daily egg production method to estimate the stock size of Western Australian Sardines (*Sardinops sagax*). Mar. Freshwater Res. 47:819-825.
- Lo, N. C. H., Y. A. Green Ruiz, M. J. Cervantes, H. G. Moser, R. J. Lynn. 1996. Egg production and spawning biomass of Pacific sardine (*Sardinops sagax*) in 1994, determined by the

daily egg production method. Calif. Coop. Oceanic Fish. Invest. Rep. 37:160-174.

Bentley, P. J., R. L. Emmett, N. C. H. Lo, and H. G. Moser. 1996. Egg production of Pacific sardine (*Sardinops sagax*) off Oregon in 1994. Calif. Coop. Oceanic Fish. Invest. Rep. 37:193-200.

Lo, N. C. H., P. E. Smith and J. Butler. 1995. Population growth of northern anchovy and Pacific sardine using stage-specific matrix models. Mar. Ecol. Prog. Ser. 127:15-26.

Lo, N. C. H. 1994. Level of significance and power of two commonly used procedures for comparing mean values based on confidence intervals. Calif. Coop. Oceanic Fish. Invest. Rep. 35:246-253.

Moser, H. G., R. L. Charter, P. E. Smith, N. C. H. Lo, D. A. Ambrose, C. A. Meyer, E. M. Sandknop, and W. Watson. 1994. Early life history of sablefish, *Anoplopoma fimbria*, off Washington, Oregon and California, with application to biomass estimation. Calif. Coop. Oceanic Fish. Invest. Rep. 35:144-159.

Jacobson, L. D., N. C. H. Lo and J. T. Barnes. 1994. A biomass-based assessment model for northern anchovy, *Engraulis mordax*. Fish. Bull., U.S. 92(4):711-724.

Jacobson, L. D. and N. C. H. Lo. 1994. Spawning biomass of the northern anchovy in 1994. SWFSC Admin. Rep., La Jolla, LJ-94-17, 13 p.

Butler, J. L., P. E. Smith and N. C. H. Lo. 1993. The effect of natural variability of life-history parameters on anchovy and sardine population growth. Calif. Coop. Oceanic Fish. Invest. Rep. 34:104-111

Hunter, J. R., N. C. H. Lo and L. A. Fuiman [Editors]. 1993. Ichthyoplankton methods for estimating fish biomass. In Advances in the early life history of fishes. Bull. Mar. Sci. 53(2), 935 p.

Lo, N. C. H., J. R. Hunter, H. G. Moser and P. E. Smith. 1993. A daily fecundity reduction method of biomass estimation with application to Dover sole *Microstomus pacificus*. Bull. Mar. Sci. 53(2):842-863.

Jacobson, L. D. and N. C. H. Lo. 1993. Spawning biomass of the northern anchovy in 1993. SWFSC Admin. Rep., La Jolla, LJ-93-13, 41 p.

Hunter, J. R. and N. C. H. Lo. 1993. Ichthyoplankton methods for estimating fish biomass introduction and terminology. Bull. Mar. Sci. 53(2):723-727.

Theilacker, G. H., N. C. H. Lo and A. W. Townsend. 1993. An immunochemical approach to quantifying predation by euphausiids on the early stages of anchovy. Mar. Ecol. Prog. Ser. 92:35-50.

- Garcia, A., N. Perez, N.C. Lo, A. Lago de Lanzos and A. Sola. 1992. The egg production method applied to the spawning biomass estimation of sardine, *Sardina pilchardus* (Walb.), on the North Atlantic Spanish coast. Bol. Inst. Esp. Oceanogr. 8(1):123:138.
- Lo, N. C. H., L. D. Jacobson, J. L. Squire. 1992. Indices of relative abundance from fish spotter data based on delta-lognormal models. Can. J. fish. Aquat. Sci. 49(12):2515-2526.
- Smith, P. E., N. C. H. Lo and J. L. Butler. 1992. Life-stage duration and survival parameters as related to interdecadal population variability in Pacific Sardine. Calif. Coop. Oceanic Fish. Invest. Rep. 33:41-49.
- Jacobson, L. D. and N. C. H. Lo. 1992. Spawning biomass of the northern anchovy in 1992. SWFSC Admin. Rep., La Jolla, LJ-92-24, 71 p.
- Lo, N. C. H., J. R. Hunter, H. G. Moser, P. E. Smith and R. D. Methot. 1992. The daily fecundity reduction method: a new procedure for estimating adult fish biomass. ICES J. Mar. Sci. 49:209-215.
- Hunter, J. R., B. J. Macewicz, N. C. H. Lo and C. A. Kimbrell. 1992. Fecundity, spawning, and maturity of female Dover sole *Microstomus pacificus*, with an evaluation of assumptions and precision. Fish. Bull., U.S. 90:101-128.
- Perez, N., I. Figueiredo and N. C. H. Lo. 1992. Batch fecundity of *Sardina pilchardus* (Walb.) off the Atlantic Iberian coast. Bol. Inst. Esp. Oceanogr. 8(1):155-162.
- Henry, F. and N. C. H. Lo. 1992. Dover Sole. In California's living marine resources and their utilization, W.S. Leet, C. M. Dewees and C. W. Haugen, eds. Sea Grant Extension Publicaion UCSGEP-92-12:97-99.
- Jacobson, L. D. and N. C. H. Lo. 1991. Spawning biomass of the northern anchovy in 1991. SWFSC Admin. Rep., La Jolla, LJ-91-19, 53 p.
- Jacobson, L. D. and N. C. H. Lo. 1990. Spawning biomass of the northern anchovy in 1990. SWFSC Admin. Rep., La Jolla, LJ-90-20, 31 p.
- Chen, C. T., T. C. Leu, S. J. Joung, and N. C. H. Lo. 1990. Age and growth of the scalloped hammerhead, *Sphyrna lewini*, in Northeastern Taiwan waters. Pac. Sci. 44(2):156-170.
- Owen, R. W., N. C. H. Lo, J. L. Butler, G. H. Theilacker, A. Alvariño, J. R. Hunter and Y. Watanabe. 1989. Spawning and survival patterns of larval northern anchovy, *Engraulis mordax*, in contrasting environments — a site-intensive study. Fish. Bull., U.S. 87(3):673-688.
- Lo, N. C. H., J. R. Hunter and R. P. Hewitt. 1989. Precision and bias of estimates of larval mortality. Fish. Bull., U.S. 87(3):399-416.

- Watanabe, Y. and N. C. H. Lo. 1989. Larval production and mortality of Pacific saury, *Cololabis saira*, in the northwestern Pacific Ocean. Fish. Bull., U.S. 87(3):601-613.
- Lo, N. C. H. and R. D. Methot. 1989. Spawning biomass of the northern anchovy in 1988. Calif. Coop. Oceanic Fish. Invest. Rep. 30:18-31
- Jacobson, L. D. and N. C. H. Lo. 1989. Spawning biomass of the northern anchovy in 1989. SWFC Admin. Rep., La Jolla, LJ-89-17, 26 p.
- Lo, N. C. H. 1989. Evaluation of the port sampling of the wet fish fishery. SWFC. Admin. Rep., La Jolla, #LJ-89-10, 58 p.
- Peterman, R. M., M. J. Bradford, N. C. H. Lo and R. D. Methot. 1988. Contribution of early life stages to interannual variability in recruitment of northern anchovy (*Engraulis mordax*). Can. J. Fish. Aquat. Sci. 45:8-16.
- Lo, N. C .H. 1988. Preliminary spawning biomass estimate of the northern anchovy in 1988. SWFSC Admin. Rep., La Jolla, #LJ-88-17, 15 p.
- Lo, N. C. H. 1987. Statistical methods in fishery biology (in Chinese) 87-01. National Taiwan College of Marine Science and Technology, 87 p.
- Lo, N. C. H. 1986. Modeling life-stage-specific instantaneous mortality rates, an application to northern anchovy, *Engraulis mordax*, eggs and larvae. Fish. Bull., U.S. 84(2):395-407.
- Lo, N. C. H., J. Alheit and B. Alegre. 1986. Fecundidad parcial de la sardina peruana (*Sardinops sagax*). Publicacion no. 28 de Procpa, Bol. Del Inst. Del Mar Del Peru 10(2):45-60.
- Lo, N. C. H. and T. D. Smith. 1986. Incidental mortality of dolphins in the eastern Tropical Pacific, 1959-1972. Fish. Bull., U.S. 4(1):27-34.
- Lo, N. C. H. 1985. Egg production of the central stock of northern anchovy, *Engraulis mordax*, 1951-1982. Fish. Bull., U.S. 83(2):137-150.
- Hewitt, R., G. Theilacker and N. C. H. Lo. 1985. Causes of mortality in young jack mackerel. Mar. Ecol. Prog. Ser. 26:1-10.
- Lo, N. C. H. 1985. A model for temperature-dependent anchovy egg development and an automated procedure for the assignment of age to staged eggs. In: R. Lasker (Ed.), An egg production method for estimating spawning biomass of pelagic fish: application to the northern anchovy (*Engraulis mordax*), p. 43-50. U.S. Dep. Commer., NOAA Tech. Rep. NMFS-36.
- Hunter, J. R., N. C. H. Lo and R. J. H. Leong. 1985. Batch fecundity in multiple spawning fishes. In: R. Lasker (ed.), An egg production method for estimating spawning biomass of pelagic fish: Application to the northern anchovy (*Engraulis mordax*), p. 67-77. U.S.

Dep. Commer., NOAA Tech. Rep. NMFS-36.

Hewitt, R., A. Bindman and N. Lo. 1984. Procedure for calculating the egg production estimate of spawning biomass. SWFC Admin. Rep., La Jolla, LJ-84-19, 46 p.

Smith, T. D. and N. C. H. Lo. 1983. Some data on dolphin mortality in the Eastern Tropical Pacific tuna purse seine fishery prior to 1970. NOAA-TM-NMFS-SWFC-34, 26 p.

Lo, N. C. H. 1983. Sample size for estimating dolphin mortality associated with the tuna fishery. J. Wildlife Mgmt. 47(2):413-421.

Lo, N. C. H. 1983. Re-examination of three parameters associated with anchovy egg and larval abundance: temperature dependent incubation time, yolk-sac growth rate and egg and larval retention in mesh nets. U.S. Dep. Commer., NOAA-TM-NMFS-SWFC-31, 33 p.

Lo, N. C. H., J. E. Powers and B. E. Wahlen. 1982. Estimating and monitoring incidental dolphin mortality in the eastern tropical Pacific tuna purse seine fishery. Fish. Bull., U.S. 80(2):396-401.

Perrin, W. F., N. C. H. Lo, and B. Wahlen. 1979. Progress in reducing the incidental kill of dolphins in the U.S. tuna purse-seine fishery in the eastern tropical Pacific. SWFC Admin. Rep., La Jolla, LJ-79-17, 3 p.

Powers, J., N. C. H. Lo, and B. Wahlen. 1979. A statistical analysis of effectiveness of porpoise rescue procedures in reducing incidental mortality. NMFS, SWFC Admin. Rep., La Jolla, #LJ-79-7.

Lo, N. C. H. 1978. California ocean shrimp mesh experiment. Calif. Fish and Game 64(4):280-301.

Lo, N. C. H. 1977. Notes on statistical concepts and application of statistical techniques to fishery biology. Cal. Dept. Fish and Game. Reference no.77-1, 116 pp.

Everett, J. and N. C. H. Lo. 1976. The incidental kill of porpoise during the first half of 1976, the date of reaching the quota and the methodologies utilized in each estimation. NMFS, SWFC Admin. Rep., La Jolla, #LJ-76-37, 29 pp.

Ferguson, N. Lo and D. Thomas. 1974. Some tests for independence. Aust. J. Stat. 16(1):11-19.

Ferguson, N. Lo. 1973. Comparison of three non-parametric tests for bivariate interchangeability. Aust. J. Stat. 15(3):191-209.